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A Strategic Approach to Curriculum Design for Information Literacy in Teacher Education – Implementing an Information Literacy Conceptual Framework

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Abstract: This paper details a conceptual framework that situates curriculum design for information literacy and lifelong learning, through a cohesive developmental information literacy based model for learning, at the core of teacher education courses at UTAS. The implementation of the framework facilitates curriculum design that systematically, consistently and incrementally develops information literacy capabilities across entire teacher education course structures, thereby facilitating teacher education students to graduate as critical thinkers, problem solvers, informed decision makers and independent, self-directed lifelong learners. As education professionals, these graduates have the potential of developing these capabilities in the children they teach. The paper discusses the development of a conceptual framework and identifies areas for future research.

The UTAS Teacher Education IL Conceptual Framework

A collaborative partnership between the Faculty of Education and the Library at the University of Tasmania (UTAS) aims to contextualise information literacy and lifelong learning outcomes within units through constructive alignment (Biggs, 1999) to ensure that they are taught, applied, and developed within unit content, then form part of the summative assessment in unit assessment tasks. This paper outlines the development and implementation of the *UTAS Teacher Education Information Literacy (TEIL) Conceptual Framework* which represents a strategic approach to the development of information literacy and lifelong learning, through a curriculum design which embeds their development within designated core units across all teacher education course structures (MacDonald, Rathemacher & Burkhardt, 2000). The *UTAS TEL Conceptual Framework* is important as it proposes a more effective and sustainable model for the development of IL in teacher education.

Introduction

Recognition of the need for the *UTAS TEIL Conceptual Framework* arose from an acknowledgment of the importance of information literacy (IL) and related skills for both the learning experience of teacher education students and their future professional practice. The *UTAS TEIL Conceptual Framework* brings together discrete elements to create a distinctive approach to curriculum design for IL in teacher education. The purpose of this framework is to combine these elements and explain how they work together to create the desired approach.

The approach advocated by the *UTAS TEIL Conceptual Framework* consists of six distinct elements.

1. The strategic process underpinning the whole philosophy of the IL conceptual framework, prescribes a top down methodology for its administration.
2. The collaborative partnership provides an environment which allows professional expertise of both the teacher education curriculum component – the academic staff, and expertise of the IL component – the Library staff, to collaborate in the design of teacher education curriculum for IL.
3. Sustainability was a requirement as the administration of this framework needs to be enduring in the current economic climate, and for the foreseeable future.
4. It anticipates in being equitable as the teacher education student cohort is diverse in background and mode of study.
5. This framework aspires to be holistic on several levels: in teacher education student research preparedness and as teaching professional lifelong learning practitioners; in teacher education courses where IL is part of curriculum design, rather than a bolt on; in the developmental design of a ‘whole of program’ approach to ensure multiple opportunities for learning experiences that develop IL and lifelong learning capabilities are systematically provided throughout entire teacher education course structures; and
6. To ensure that IL development is contextualised within unit content so that both the cognitive/meta-cognitive and mechanical skills of IL are taught, applied, assessed and developed within curriculum content, not as a separate traditional library skills session.

Development of the Conceptual Framework

The design and implementation of the framework were shaped by three key external drivers: the increased relevance of information skills; Australian federal government policies for higher education; and the implementation of the Australian curriculum.

The advent of the ‘Information Age’ where information is constantly evolving, has been identified as having a major impact on our lives as global citizens (American Library Association (ALA), 1989; Candy, Crebert & O’Leary, 1994; Ministerial Council on Education Employment Training and Youth Affairs (MCEETYA), 2008), and to be an active participant and learner in this world, certain skills have been identified as essential. These fall broadly across the categories of “cognitive, interpersonal and intrapersonal skills” (Koenig, 2011, p. 2), sometimes referred to in the literature as ‘21st century skills’. However, it is generally agreed that these skills are neither new nor are they century specific (Breivik, 2005; Lai & Viering, 2012; Larson & Miller, 2011), but rather are gaining increasing relevance and importance as a result of the information explosion (Bundy, 1998). These skills empower people to engage in learning and as informed global citizens in the ‘Information Age’ (Rotherham & Willingham, 2009).

The basis of informed global citizenship and learning is the ability to critically engage with information, and can best be described by the characteristics of an information literate person. Being ‘information literate’ means that individuals are able to recognise when information is needed and have the ability to scope, access, evaluate, manage, synthesise, and ethically use information for any task or decision that they are required to undertake (Association of College and Research Libraries (ACRL), 2000; Council of Australian University Librarians (CAUL), 2001; Society of College National and University Libraries (SCONUL), 2011). Candy et al., (1994) notes that being information literate “involves the higher order skills of analysis, synthesis and evaluation, the ability to think critically, to construct and reconstruct understanding in the light of new learning experiences” (as cited in

Bundy, 2004c, p.6). IL skills and capabilities form a subset within the range of cognitive, inter and intrapersonal skills which have been deemed necessary in the 21st century. They also underpin the higher order cognitive and meta-cognitive skills like critical and creative thinking, problem solving, informed decision making, communication and independent self-directed learning (Bruce, 1994; Bundy, 1998; Koenig, 2011; Radar, 2002) which are of particular interest to teacher education (Johns, 2008) and the new Australian Curriculum (Australian Curriculum Assessment and Reporting Authority (ACARA), 2012b; Australian Institute for Teaching and School Leadership (AITSL), 2011).

It is important to note, that although the element of Information and Communication Technology (ICT) features quite prominently as a capability required in teacher education and education in general, and currently has significant impact on and within the information landscape, it does not form part of our definition for being information literate. ICT can be seen as a specific context for information with its own set of capabilities that are required to engage with information. Our underpinning philosophy identifies information literacy, not information technology, as the principle element and focus in the shift towards a lifelong learning educational paradigm (Bundy, 2003). Therefore we deliberately chose to remove all context, including that of ICT, surrounding IL and have based our definition of IL on its basic fundamental principles. We do recognise, however, that developing ICT skills is becoming an essential attribute for learners to engage with information that is accessed through technology.

As the information landscape is constantly changing, learning becomes a continuous process, and lifelong learning emerges as a key capability for the 21st century, and as such can be added to the subset of skills and capabilities that are underpinned by IL (Bruce & Candy, 1995; Ralph, 1999). Within the continuous lifelong learning process, IL provides the constructs for 'learning how to learn' (ALA, 1989; Bundy, 2004c). The significance of the IL based model for learning how to learn is that it facilitates deep rather than surface learning, and provides the opportunity for individuals to develop as independent, self-directed lifelong learners (Bruce, 2004). Therefore, in order to be a learner and an informed global citizen, an individual needs to acquire IL and lifelong learning skills and capabilities (Breivik, 2005; Candy, 2002).

There is a widespread misconception, however, that these skills and capabilities are innate or can be picked up along the way (Daragan & Stevens, 1996; Doherty, Hansen & Kaya, 1999). Ongoing research and much discourse has clearly indicated though, that as with most other skills and capabilities, those of IL and lifelong learning need to be scaffolded and taught (Bruce, 1995; Eisenberg, 2003; Snavely & Cooper, 1997). To ensure that the teaching and learning of these capabilities be made available to all and not just a select few; there has been extensive advocacy (Bruce, 1994; Bundy, 2001b, 2003; Todd, 1995) for education institutions to provide an "education that intentionally helps students learn these skills" (Rotherham & Willingham, 2009, p. 18; Kimmies & Stagg, 2009). Any education process embracing an educational paradigm that has an IL based model for 'learning how to learn' as its central focus, will have a major impact on learning outcomes for students (Bundy, 2002). The *UTAS TEIL Conceptual Framework* has been designed to make IL and lifelong learning skills and capabilities explicit as learning outcomes that are developed consistently and cohesively throughout the curriculum of a higher education degree.

A second significant driver for an IL framework relates to federal government policies for higher education (Australian Government, 2009b) which has seen student numbers increase dramatically over the last decade (Australian Bureau of Statistics, 2012). The growing teacher education cohort at UTAS has wide cultural, socio-economic, and geographic diversity; students articulate a variety of reasons for embarking on university study; they come from a wide range of backgrounds, everyday living environments, and

differing life commitments. Entry into UTAS teacher education courses is possible through a variety of pathways, all of which provide differing levels of preparation for university study. Teacher education courses are available as on-campus, fully online or a blended delivery. As is the case for most universities, UTAS has certain expectations of student academic and multi-literacy capabilities, but research shows that most students arrive at university lacking or being limited in these capabilities (ACRL, 2001; Crouse & Kasbohm, 2003). The great diversity of student backgrounds and study modes, together with the diversity in levels of university preparedness, results in a large diversity in student IL capabilities and academic research readiness at time of enrolment, creating challenges for students and academic staff alike (Crouse & Kasbohm, 2003). The implementation of the *UTAS TEIL Conceptual Framework* will provide equity of opportunity for all students to systematically and cohesively develop IL and lifelong learning skills throughout their teacher education degree.

The third and most significant factor driving the development of the framework was the release of the newly developed draft of the Australian Curriculum. Not only do students graduating from teacher education courses need to develop IL and lifelong learning skills and capabilities throughout their academic lives as do graduates from other courses, teacher education students graduate to become classroom practitioners who are in the unique position of being required to model, as well as design learning experiences that develop these capabilities in their own students (ACARA, 2012a, 2012b; MCEETYA, 2008). Teachers play a pivotal role in the provision of learning experiences which assist their students to use information knowledgeably (ACRL, 2011; Lipu, 2003); in order to assist their own students to navigate an information-rich world, teachers require that their own IL capabilities be well developed. They themselves need to be able to critically engage with, synthesise, process and present information appropriately for purpose and audience, and be able to use information ethically to substantiate their arguments, in order to model and teach these skills, understandings, processes and strategies to their students. Teacher education courses, therefore, are pivotal to enabling future teachers to develop the necessary IL skills for their profession. They can potentially do this by assisting the teachers to be information literate themselves, enabling them as students to complete their academic work and become capable members of a learning profession, but also to teach them how to teach and assess the IL skills of their own students (Shinew & Walter, 2003).

Through the ACRL, the US leads the way in translating a recognition of IL capability, into a set of standards for IL development in Teacher Education courses (ACRL, 2011). It is difficult, however, to find an explicit recognition of the pivotal nature of IL skills for graduate teachers, or the importance of the development of such skills in teacher education courses in the recently published *National Professional Standards for Teachers* (AITSL, 2011a) or in documents relating to the *Accreditation of Initial Teacher Education Programs* in Australia (AITSL, 2011b). It is possible, however, to assume the presence of these skills and understandings in some of the required graduate standards (e.g. focus areas 2.6, 3.4, 4.5, 6.2, 7.1 and 7.3).

Finally, the Australian curriculum, guided by the *Melbourne Declaration on Educational Goals for Young Australians*, commits "to supporting all young Australians to become successful learners, confident and creative individuals, and active and informed citizens" (MCEETYA, 2008, p. 8); goals which presuppose highly developed IL skills for all Australians. The Australian Curriculum and Reporting Authority (ACARA), charged with overseeing the development of a national curriculum, commits to assisting students to become critical and creative thinkers, problem solvers, self-directed independent learners (ACARA, 2012), or information literate people, able to sustain their own lifelong learning (Bundy, 2004c). As the Australian Curriculum is currently being enacted in classrooms throughout Australia, our teachers will require the appropriate levels of IL to be able to

implement it effectively for the benefits of their students' learning. In order to do so, the teacher education courses that they undertake need to prepare them appropriately. The implementation of the *UTAS TEIL Conceptual Framework* provides the opportunity for IL and lifelong learning skills and capabilities to be systematically taught, applied, assessed and developed through curriculum design for IL throughout teacher education degree structures, enabling teacher education students to be better prepared as teachers of these capabilities themselves.

The *UTAS TEIL Conceptual Framework* situates IL capabilities and their development at the core of curriculum design in teacher education programs (Bundy, 2002; Shaw, 2009). The implementation of this framework provides, therefore, the opportunity for students to develop these capabilities which have the potential to facilitate teacher education students to graduate as critical and creative thinkers, problem solvers, informed decision makers and independent, self-directed lifelong learners, and as education professionals capable of guiding the children they teach along a similar path. The framework draws strongly upon the IL literature, and builds upon understandings of IL in higher education gleaned from several decades of scholarly debate across the sector.

IL in Higher Education

The way IL was perceived and engaged with in higher education was transformed, when Bruce challenged, extended and then broadened traditional understandings of IL (Bruce, 1997; Bundy, 1999), resulting in a philosophical shift. Bruce drew the conclusion that different ways of relating to and experiencing IL make it a significant contributing factor to lifelong learning. This allowed IL to be positioned at the heart of the strategic direction of educational institutions, and contributed to a major shift in the educational paradigm from resourced-based to learner-centred learning (Bundy, 1998, 2004a, Kuhlthau, 1995). Learner or student-centred learning focuses on developing cognitive and meta-cognitive skills which facilitate deep rather than surface learning, and which form the basis for critical thinking, problem solving, and self-directed lifelong learning (Bruce, 2004). The subsequent publication of Information Literacy Standards by the Australian and New Zealand Institute for Information Literacy (ANZIIL) provided the framework to enable curriculum design for IL and lifelong learning within education programs (Bundy, 2004c). These standards firmly situate IL within a student-centred educational paradigm (Lupton, 2008; Plotnick, 1999) and underpin a variety of IL models in higher education.

Integrated IL Models

Research has identified that embedding IL within a discipline enhances student learning (Bundy, 2004a; Hooks et al., 2007; Lupton, 2002). IL models, standards and frameworks reflect the thinking that the development of IL capabilities cannot be done in isolation (Bruce, 1995; Grafstein, 2002; Orr, Appleton & Wallin, 2001; SCONUL, 1999). In many higher education institutions, IL is identified as a graduate attribute and is embedded into the student learning experience. When IL is embedded into a discipline as a graduate attribute, it is shaped by the discipline, thereby determining how as an attribute it is developed within that discipline (Bruce et al., 2006). Further, due to the fact that the epistemological structure differs from one discipline to another, the processes of teaching, learning and research within each discipline will vary (Grafstein, 2002). Equally, if we agree that IL is "an independent and critical way of thinking and reasoning about disciplines" (Grafstein, 2002, p. 197) and "a

way of thinking and reasoning about aspects of subject matter" (Bruce, 2000, p. 4), then we could also surmise that it is a basis for engaging with discipline content and a model for learning within discipline content, and as such IL pedagogy and development would also be shaped by the discipline. Therefore, an educational model that embeds IL into a learning experience would enhance student learning by providing students with a model for learning how to learn within their discipline of study.

The most powerful model for integrating IL is one in which IL is positioned within the curriculum through intentional curriculum design for information literacy and lifelong learning, based on Biggs's (1999) principle of constructive alignment (Bruce, 2000).

According to Bruce (2002), curriculum designed in this manner focuses on the design of the learning experiences that develop IL and lifelong capabilities, together with the teaching and the assessment of these capabilities within discipline content. The challenge of adopting such a model for librarians and academics alike, is that designing curriculum for IL and lifelong learning within discipline content requires not just good will, but also an extensive ongoing collaborative partnership between faculty and library (Devereux & Wilson, 2008; Doskatsch, 2003; Harrison & Rourke, 2006).

Integrated IL Models – an Australian context

In recent years, a number of models for embedding or integrating IL in teacher education courses have been developed (Asselin & Lee, 2002; Crouse & Kasbohm, 2003; Floyd, Colvin & Bodur, 2008), but two are of particular significance in the Australian academic environment (Hobs & Aspland, 2003; Lipu, 2003). Both advocate a strategic, top down, whole of program, student learning-centred approach, and both models identify units where IL is embedded or integrated. The conceptual frameworks of the two models are very similar, whereas their approaches to implementation differ significantly. Lipu's research focuses on the integration of a compulsory generic IL unit developed independently of the teacher education curriculum, into targeted teacher education units across the course. The second model (Hobbs & Aspland 2003) is based on the Framework and Syllabus developed by Peacock (2002), and provides a blueprint for the design of a teacher education curriculum which embeds IL throughout all units within an undergraduate course. Evaluation of the positive and negative attributes of both Australian models contributed towards informing the design of the *UTAS TEIL Conceptual Framework*.

Designing a New Model to Develop IL Capability Within Teacher Education Courses

The *UTAS TEIL Conceptual Framework* takes a more holistic approach than either the Hobs and Aspland or Lipu's models, supporting the development of IL and lifelong capabilities consistently and systematically within core units throughout entire degree structures (Lupton, 2002). This is a major undertaking that requires a commitment of resources for its design, development, implementation, evaluation, and research. However, despite the challenges, this innovative approach provides a supportive and scaffolded learning environment within teacher education degree structures. This learning environment facilitates the development of teacher education students as research-ready, information literate, lifelong learners and informed global citizens, who have the potential to design learning experiences that develop these capabilities in their own students. Both the Faculty of Education and the Library at UTAS agree that *UTAS TEIL Conceptual Framework* establishes a blueprint for a strategic, sustainable and equitable approach to IL development and is a valuable long term

investment in teacher education. This approach provides the direction for the design and development of an educational paradigm that should have a significant impact on learning outcomes of a growing and diverse cohort of students, through all modes of study currently available at UTAS.

The information that follows represents the initial phase of the design, development, and implementation of the *UTAS TEIL Conceptual Framework*.

The UTAS TEIL Conceptual Framework

The Design of the Framework

The pivotal philosophy underpinning the *UTAS TEIL Conceptual Framework* is that it advocates a strategic approach to positioning IL in higher education. This approach acknowledges and articulates the importance of IL and related skills for the learning experience of higher education students by making them more visible within student learning as attributes that are required by graduates (Barrie, 2007; Corrall, 2008; George et al., 2001; Shapiro & Hughes, 2996). Regrettably, the most common practice in making IL more visible in students learning has been and is currently the ground up approach, which involves librarians working with individual faculty teaching staff to deliver IL instruction within isolated units of study (Badke, 2008; Cochrane, 2006; Cox & VanderPol, 2004; Farber, 1999; Hearn, 2005; Jacobson & Mark, 2000). As has been proven over time, this fragmented approach to IL in higher education is neither effective nor efficient in many aspects (ACRL, 2000; Asselin & Doiron, 2003; Bruce, 1995, 2004; Bundy, 1998), and a more sustainable model emerged in IL research and discourse.

At UTAS, the Faculty of Education and the library established a strategic collaborative partnership for the design of teacher education curriculum (Grafstein, 2002) which facilitates the development of IL and lifelong learning capabilities across entire teacher education degree structures (Lupton, 2002). The collaborative partnership progressed the planning and development of this initiative by means of strategic processes and committees in the Faculty. The proposal for design and implementation of the conceptual framework was endorsed by the Faculty of Education Learning and Teaching Committee (FELTC) of which the Liaison Librarian Education is a voting member, and the Faculty Executive Committee. It was agreed that the conceptual framework would:

- a) Develop a strategic, holistic, sustainable and equitable approach to curriculum design that has the potential to develop teacher education students as self-directed independent lifelong learner, critical and creative thinkers, problem-solvers and informed decision makers in the global community;
- b) Build a collaborative partnership in curriculum design for the learning, teaching and assessment of IL and lifelong learning capabilities, between the Library and the Faculty of Education;
- c) Constructively align unit curriculum design to build capacity for IL and lifelong learning into unit content of all course structures for all modes of course delivery;
- d) Facilitate curriculum design, based on the IL models for learning and the development of IL and lifelong learning capabilities, which supports the principles of a scaffolded whole program approach; and
- e) Provide a Toolkit to be used as a strategic resource in collaborative curriculum design by stakeholders in teacher education courses in order to assist the implementation of the *UTAS TEIL Conceptual Framework*.

The ownership and carriage of this initiative occurs within a designated Faculty Task Group, of which the Liaison Librarian Education is an active member, and which reports directly to

FELTC. Within this task group, the role of the librarian is that of the Faculty IL Coordinator working collaboratively with the task group leader and member academic staff to implement the framework at course structure and unit level. This group is also actively involved in developing documentation, including that which will detail how the implementation of the *UTAS TEIL Conceptual Framework* contributes to teacher education courses in supporting IL related elements within standards, threshold learning outcomes, and state teacher registration board requirements, and IL and lifelong learning skills required by the Australian Curriculum. This document will be submitted as part of the next re-accreditation process of teacher education courses at UTAS.

Working at this level activates the holistic methodology that has been built into our framework to allow teacher education curriculum of entire degree structures to be viewed through 'the lens of IL'. The fundamental elements that regulate the teacher education environment in Australia provide the characteristics of the 'teacher education IL lens', which in turn guides the construction of curriculum design for IL and lifelong learning (SCONUL, 2011) in teacher education courses at UTAS. The development of a 'teacher education IL lens' is based on understandings of IL that have been defined for the UTAS teacher education environment, and that form the constructs of an IL based model for learning.

Given the current declining economic climate and recent government mandates that will direct the higher education agenda in the foreseeable future in Australia (Australian Government, 2008, 2009a), we are looking to the *UTAS TEIL Conceptual Framework* to provide us with a more sustainable model for the development of IL and lifelong skills as attributes in future teacher education graduates. The framework and tools enable curricular design and targeted scaffolded and equitable learning opportunities to address the gap in IL and lifelong learning capabilities in a systematic and consistent way, and facilitate students to achieve the required levels for these capabilities by graduation.

Understanding of IL Within UTAS Teacher Education An IL Based Model for Learning How to Learn and Gain Content Knowledge

The model for building IL capability encapsulates and extends some principles of the SCONUL model which identifies the elements of IL as seven pillars that allow for a holistic and continuing IL development of the individual (SCONUL, 2011). The UTAS model reconceptualises the SCONUL pillars into a cohesive three-dimensional model of the skills, understandings, processes, and tools that facilitate development of IL capability through a multi-layered model. This multi-layered model can be used within teacher education courses to develop IL and gain content knowledge. The following sections of the paper outline the construction of the IL based multi-layered model.

The First Layer

The elements and skill set of IL capability form the very top layer of the model (Fig. 1). IL standards (Bundy, 2004c) that informed our approach were distilled to identify individual IL elements. These elements define the cognitive/meta-cognitive and mechanical skills that are fundamental constructs of IL. In the model, an information literate person is surrounded by the jigsaw pieces that are the IL elements. To become information literate, the person uses elements of IL – the ability to acknowledge the need for information, ability to scope, access, evaluate, manage, synthesise and use information – which underpin the cognitive/metacognitive and mechanical skill set necessary to critically engage with information.

Figure 1 shows an individual positioned at the centre of the model using the elements and skill set of IL which are depicted as seven interlocking jigsaw pieces. The circular structure indicates that the process of IL development is not linear but is constantly evolving. The developmental aspect of capability for each IL element is represented through the use of colour and shading within each jigsaw piece. The coloured shading is more intense closer to the centre of the model to indicate strongly developed IL capability, growing paler towards the outer edge indicating decreasing IL capability. Each jigsaw piece signifies an individual's potential to develop capability in each IL element from novice to advanced. The pieces interlock to indicate the continuous iteration between the IL elements and the individual at the centre of the model, and represent a holistic developmental approach towards IL capability. In this model an individual can be actively developing several IL elements simultaneously, and be at varying levels of capability across the elements (SCONUL, 1999, 2011).

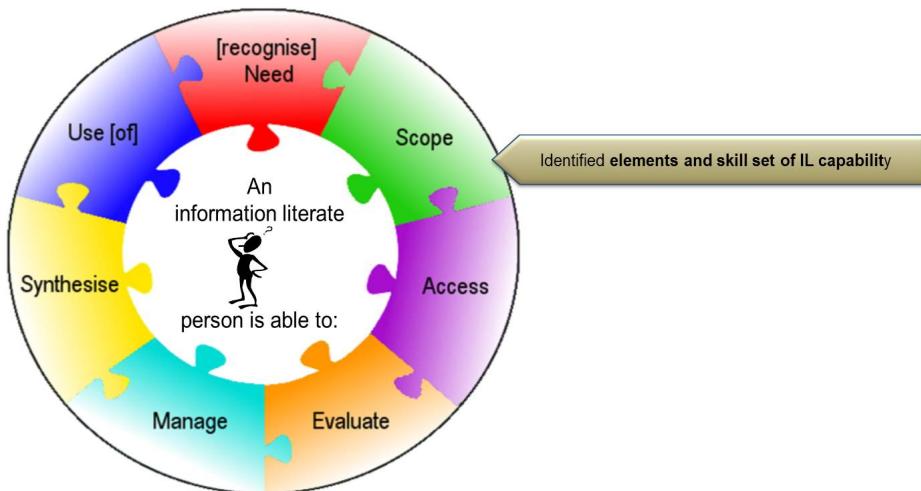


Figure 1. Elements of IL capability distilled from ANZIIL standards.

The Second Layer

The second layer adds a sequential process to the model and represents the building of IL capability which occurs when the IL elements and skill set described in Figure 1 are applied sequentially. When applied sequentially this process enables an individual to critically engage and deal with information (Fig. 2).

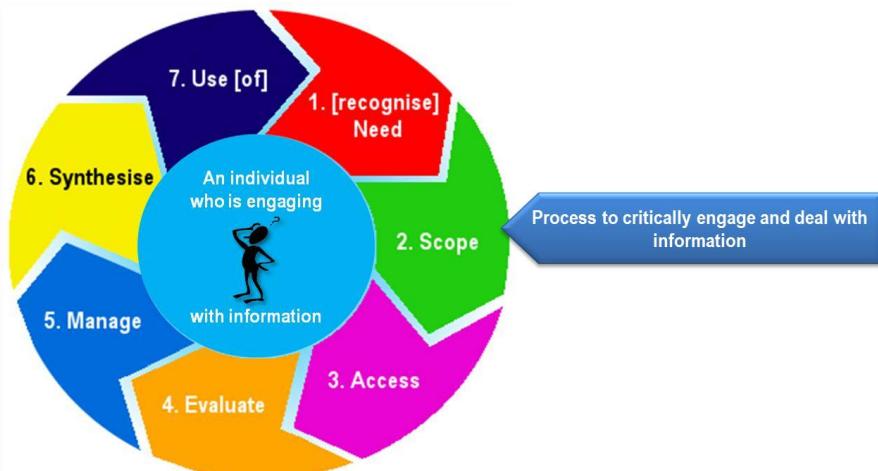


Figure 2. Sequential process to critically engage and deal with information.

Combining the Layers

By combining elements and skill set of IL capability (Fig. 1) and the sequential process of critically engaging with information (Fig. 2), a stacked, two layered model emerges. It is generic in nature, as at this stage it is not yet operating within any context, and therefore has been called the *Generic IL Based Model* (Fig. 3).

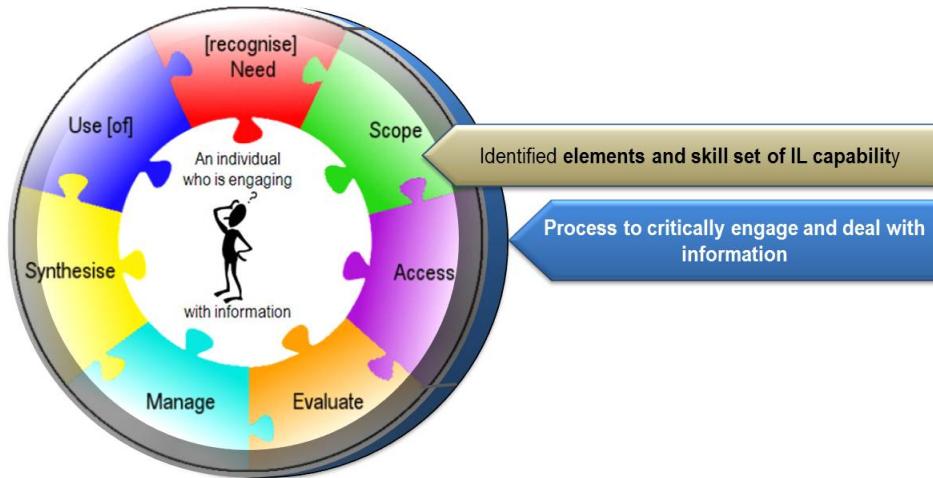


Figure 3. The Generic IL Based Model.

Third Layer

In the SCONUL model, IL lenses were “developed for different user populations to enable the model to be applied in specific situations” (SCONUL, 2011, p.6). Earlier discussion highlighted the fact that developing and building IL capability cannot be done in isolation as it requires a context within which to develop. The *Generic IL based model* provides the point of engagement between an individual and the context within which they are operating; this point of engagement is referred to as the *IL lens*. The individual’s specific context will determine the components of the IL lens through which that context can be viewed. This has been represented through the addition of a third layer to the *Generic IL Based Model* depicting the *Context IL Lens* that enables the individual to engage and deal with information within that context. In the model, at this stage, the *Context IL Lens* is depicted in a neutral grey to represent that the individual has not yet engaged with any context. The generic nature of this model makes it transferable from one context to another. The model now articulates the components required by an individual for learning how to learn within any context, and has been aptly called the *Generic Model for Learning How to Learn* (Fig. 4.).

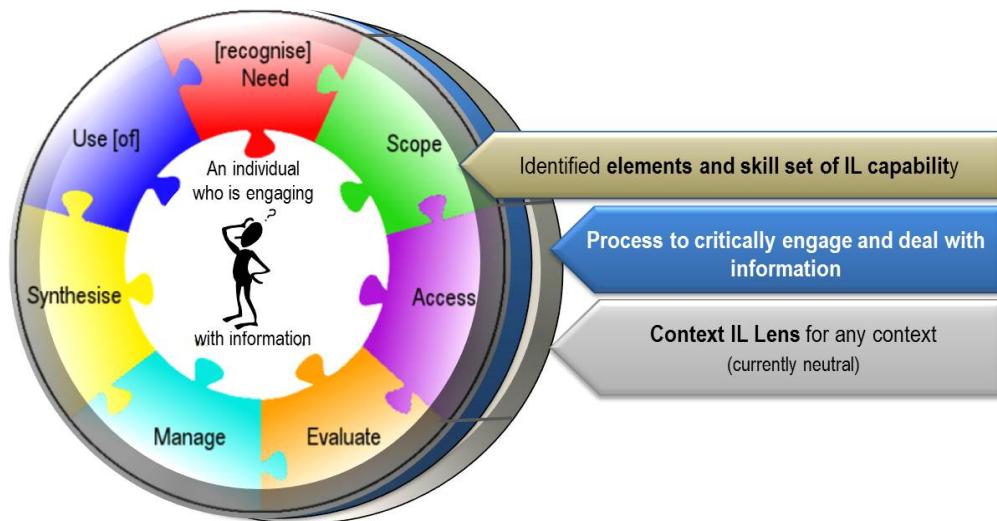


Figure 4. Generic Model for Learning How to Learn within any context.

Applying the Generic Model to a Specific Context

The generic model can be applied to any context and this paper discusses the model in relation to teacher education, which is depicted in Figure 5 with a pale orange backdrop. The orange backdrop changes the model from being generic to one that is operating within a specific context – *Learning how to learn within teacher education*. It is important to note that when the generic model is applied to a context and becomes a model for learning how to learn within a specific context, the grey coloured *Context IL Lens* in the model changes colour to indicate that the specific context comes with its own epistemology. As the epistemology of a subject area shapes the way an individual engages with information (Grafstein, 2002) within that context, then the constructs of a *Context IL Lens* will determine how IL elements will develop and be used within that specific context.

As individuals always operate within a context, *building IL capability* can only occur with reference to a specific context (Radomski, 1999), and *developing IL capability* becomes an independent and critical way to engage with information comprising subject content within that context (Bruce, 2000; Bruce et al., 2006). Thus, IL is contextualised within subject content, and individuals can use the *Context IL lens* to explore content information and gain content knowledge. For example, information and knowledge are arranged differently in teacher education than they are in other subject areas (e.g. science, history, visual arts, music). Therefore, the way that curriculum documentation or lesson plans are engaged and dealt with will be different to the way that musical notation, scientific formulas and reports, or analyses of historical events are engaged and dealt with. Each context will require IL skills, understandings, processes and strategies to be applied in a particular way, specific to that subject area. The epistemology of a context will in turn shape the pedagogy and development of IL in each IL element jigsaw piece (Grafstein, 2002). In the model, therefore, the neutral grey of the *Context IL Lens* changes to orange representing the epistemology of the specific context that the model is operating within, transforming the *Context IL Lens* into the *Teacher Education IL Lens* (Fig. 5). This step completes the model and enables the individual to critically engage and deal with information and explore content knowledge within teacher education.

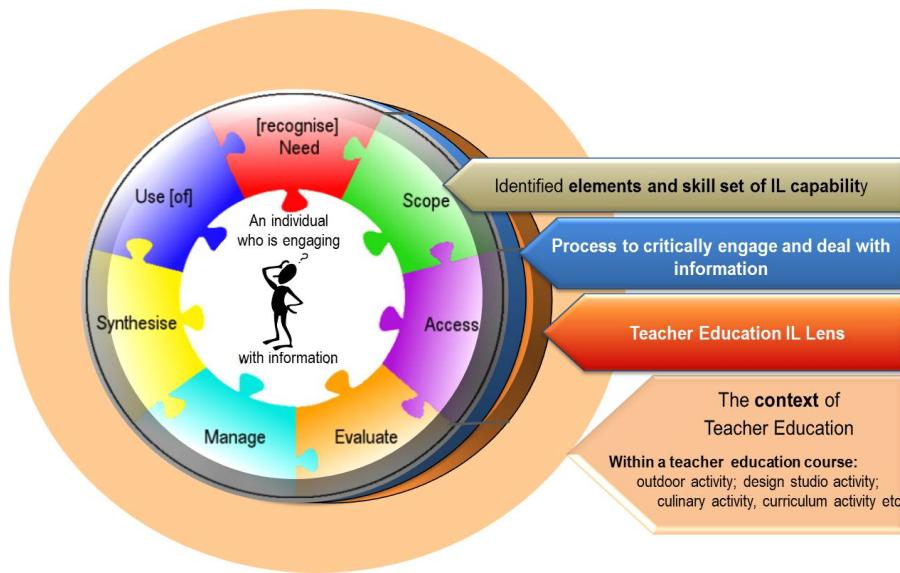


Figure 5. Model for Learning How to Learn within Teacher Education

Transferability of This Model Between Contexts

As individuals operate within multiple contexts, when the individual moves from one context to another, both the constructs within the *Context IL Lens* and the way elements of IL develop within the different context will change accordingly. For example, in real life situations we may move between the context of being a teacher education student, to the context where we work as a professional in a child care centre, to the context of family accountant for the family business. We carry within us the *Generic model for learning how to learn*, held in readiness to engage and deal with information within any context we may find ourselves in. In each context information and knowledge is different, arranged in different ways, requiring different ways to critically engage and deal with this information, and requiring adjustment of the way elements of IL skills, understandings, processes and strategies are used within that specific context.

As we move from one context to another throughout the day or week, the IL lens will change depending on which context we operate within. What remains the same and transfers from one context to another are the layers of the model that are generic to each context – the elements and skill set of IL capability, the process for critically engaging and dealing with information, and the neutral *Context IL Lens* layer. What changes are the constructs of the *Context IL Lens* as soon as the individual engages with a new context, determining how we engage and deal with the information within that context.

Identifying the Constructs for the Teacher Education (TE) IL Lens

The epistemology of teacher education provides the constructs of the *TEIL Lens*. To construct a *TEIL Lens* involves the deconstruction of the teacher education context into its fundamental components and their requirements. Teacher education sits within the higher education environment. Therefore an IL lens specific to teacher education within the higher education context requires IL capabilities and understandings requisite to a higher education environment be identified for an overarching 'higher education/academic IL lens'. This works in tandem with the teacher education environment and the IL environment, which

identify required threshold levels of IL capabilities and understandings for teacher education. These three components combine as constructs of the *UTAS TEIL lens* (Fig. 6).

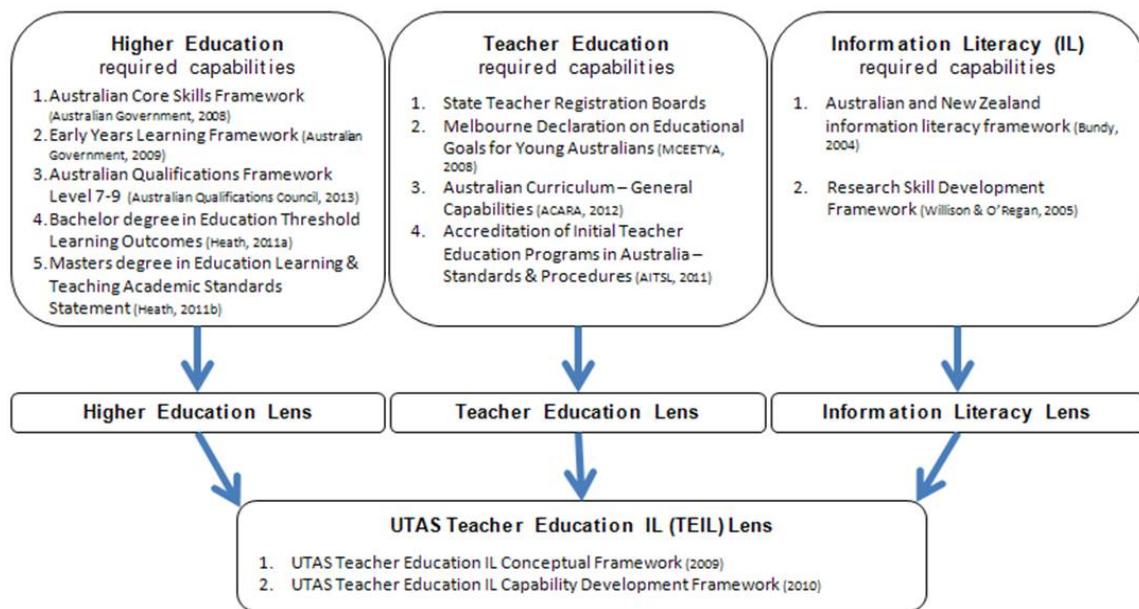


Figure 6. UTAS TEIL Lens constructs

When the *UTAS TEIL Lens* is applied within the context of a teacher education course, the subject specific context of a unit of study within that course identifies required capabilities and understandings that construct 'the subject specific IL lens' for that unit. For example, a teacher education student is required to engage with a wide variety of subject areas for purposes of curriculum – maths, dance, geography, or subject areas dealing with the profession – human development and movement, curriculum and pedagogy, inclusive practices, planning, assessment and reporting. As the teacher education student proceeds throughout their degree, the way IL is used for engaging and dealing with information in each of those subject areas changes depending on the subject context.

Within the context of a particular unit of study, the student moves from one sub-topic to another, hence the overarching IL lens determined by the subject context of the unit will be refined to deal with the more focused information within the sub-topics. Therefore, the IL lens that provides a means for dealing with information within a sub-topic will continue to be refined as the information that is being dealt with becomes more focused and specific. For example, a unit exploring 'curriculum and pedagogy' can be conceived of as being divided into several sub-topics, some that deal with the curriculum, and some that deal with the aspect of pedagogy. Each sub-topic will have its own requirements for engaging and dealing with information – how curriculum information is engaged with will be different to how policy or planning information is engaged with. Each sub-topic will determine the requirements for IL capabilities and understandings to be applied in a way that is specific to that sub-topic and which will enable the learner to explore and build appropriate content knowledge. As the focus within subject content is refined and becomes more specific, the requirements for the application of IL, i.e. the IL lens, also become more refined and specific.

Based on these assumptions, the *TEIL Lens* within the model for *Learning How to Learn within Teacher Education* can be applied within any subject area of a teacher education course and be used to explore and gain content knowledge in that subject area. The *TEIL Lens* will also determine the development and threshold learning outcomes for each element of IL throughout the teacher education course structure (Fig. 7). For example, as the teacher

education student proceeds through each year of their degree, the complexity of information they are expected to critically engage with increases. Therefore, the constructs of the *TEIL Lens* in each unit of study throughout every year of a teacher education degree will vary, depending on the research threshold learning outcomes that are required for teacher education students at that particular point in their degree.

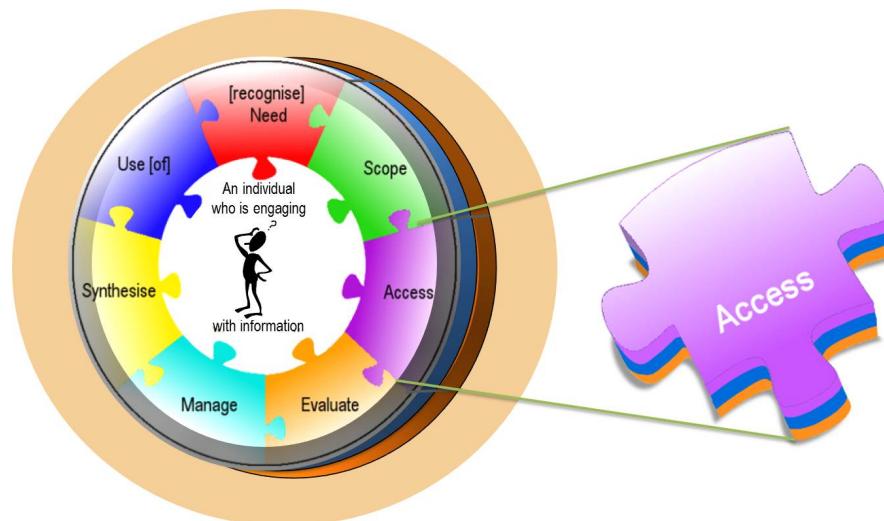


Figure 7. The Teacher Education IL (TEIL) Lens

The *TEIL Lens* makes it possible for conversations about curriculum design to take place between teaching staff, IL coordinator, and the student, regarding the personal development of IL capabilities of an individual, and the development of strategies for building content knowledge in that subject area. This lens shifts the position of IL from the traditional fragmented ground up approach of teaching library skills, to the holistic (Secker & Coonan, 2011) and strategic approach of contextualising IL through curriculum design within the higher educational paradigm. The *TEIL Lens* provides the method for contextualising IL within teacher education curriculum content and underpins the principles of constructively aligned curricular design for IL as suggested by Bruce (2000).

Implementing the UTAS TEIL Conceptual Framework Through a Toolkit for Curriculum Design

The implementation of the *UTAS TEIL Conceptual Framework* IL incorporates the following principles; IL will:

- be undertaken in a systematic manner;
- be consistent in approach and message;
- be developed at point of need as a collaborative effort;
- incrementally develop IL and lifelong learning capabilities throughout entire teacher education course structures; and
- be explicit in and relevant to unit content and the student learning experience through constructive alignment.

In order to achieve this, a supplementary toolkit made up of four components was developed:

1. *TEIL Capability Development Schema*
2. *TEIL Threshold Learning Outcomes*
3. *TEIL Learning Pathways*

4. *TEIL Scaffolded Online Tutorials for Teacher Education Programs*

Whilst these four components will be the focus of subsequent papers, key elements are outlined below.

1. *TEIL Capability Development Schema*

In collaboration with teacher education academic staff, the *TEIL Capability Development Schema* was created for both the two-year and four-year degrees. These developmental frameworks, based on the *Research Skill Development Framework* originally devised by Willison and O'Regan (2005, 2007), provide thresholds for learning outcomes of IL capability required by the Faculty of Education at UTAS for each ANZIIL IL standard (Bundy, 2004c), and its incremental development throughout the entire course structure of a four and a two year teacher education course. Incrementally developing IL within a 'whole of program' approach ensures a consistency and cohesiveness of curricular design for IL and lifelong learning, providing an essential construct in the 'teacher education IL lens'. Adopting this approach contextualises IL within curriculum content as an IL lens. Therefore, IL is no longer a 'bolt on' which views curriculum content from the outside in, but a lens through which this content is explored from the inside out (ACRL, 2000; Bruce, 1995; SCONUL, 1999). Hence, IL is:

- addressed at the unit level;
- constructively aligned as unit Learning Outcomes;
- identified as assessment criteria; and
- part of the summative assessment of that unit.

2. *TEIL Threshold Learning Outcomes*

To further ensure that IL capability was developed systematically and incrementally through the *TEIL Learning Pathways*, *IL Threshold Learning Outcomes* were identified to benchmark desired IL capability levels for each year of a teacher education course. The flexibility of having year-long outcomes make it possible for conversations on cohesive curricular design to take place horizontally across all semesters in the whole year, as well as vertically down through all years of a teacher education course. This inbuilt flexibility allows the spanning of IL learning outcomes across multiple assessment tasks within core units throughout an entire year. That way, the configuration of learning outcomes focused on developing IL capabilities to the required levels can be adjusted across the units in that year, depending on the type of assessment.

As the epistemology of the subject area in a unit is the context that shapes the IL lens through which the content of a subject area is explored and constructed, it also contributes to the selection of the IL learning outcomes that are most suitable. Constructively aligned curriculum design ensures that the IL learning outcomes then appear as assessment criteria within assessment tasks, and articulate into elements within the marking schema that determines the summative grade for that assessment task.

Working together the *TEIL Learning Pathways* and the *IL Threshold Learning Outcomes* provide the constructs of curriculum design for IL and lifelong learning across entire degree structures.

3. *TEIL Learning Pathways*

A series of maps were developed detailing the pathway for curriculum design for IL and lifelong learning from enrolment to graduation, to ensure the incremental and systematic development of IL and lifelong learning capabilities. These maps were based on the research done by Hobs & Aspland (2003) and Peacocks QUT IL Framework & syllabus (Peacock, 2002), which implemented both a framework and syllabus. Unlike the Hobs & Aspland model which embedded IL into all 151 units of the BEd program (Hobs & Aspland, 2003), or the Lipu model which identified discrete targeted units (Lipu, 2003), the *TEIL Learning Pathways* identified Professional Studies core units throughout both the four-year and two-year teacher education structures. This allowed for consistent and systematic curricular design conversations around IL to take place between stakeholders, spanning across entire teacher education degrees in a cohesive sustainable fashion.

The IL learning pathway for each course structure is designed to capture the entire student cohort and provide multiple opportunities for the development and assessment of IL capabilities ensuring that no student falls through the cracks. This series of maps could then be used as templates to facilitate curriculum design for IL and lifelong learning within any two and four year degree structures.

4. *Scaffolded Online Tutorials for Teacher Education Programs*

The implementation of the *TEIL Capability Development Schema* through the *UTAS TEIL Lens*, using the *TEIL Learning Pathways* and applying the *TEIL Threshold Learning Outcomes* requires a set of tools. These tools facilitate this implementation and also underpin our key philosophy for the need of a sustainable delivery and equitable access to scaffolded IL capability learning and building opportunities. The *TEIL Toolkit* includes packages designed to address the needs that stakeholders may have in the area of IL, IL pedagogy, and its delivery. This includes packages for:

- the Liaison Librarian coordinating IL in the Faculty;
- the Faculty staff;
- the community and accrediting stakeholders; and
- the student cohorts (Student Package).

At the time of writing this paper, the packages are in various stages of development and completion. Thus we will touch only briefly on the **Student Package**, as it is at this point in our discussion that this package plays a major role.

The **Student Package** is a series of online interactive audio visual tutorials that aim to address the IL gaps of student cohorts by providing access to asynchronous learning of necessary IL skills, understandings, processes and strategies, and development of capabilities at point of need, to enable students to achieve required levels of IL capability and IL learning outcomes. The Information & Research Skills (IRS) tutorial (Fig. 8) contains four levels – Levels 1, 2, 3 and 4, each corresponding to a year within a teacher education course structure. Each Level is appropriately scaffolded to facilitate the incremental building of IL capabilities that have been identified as desired IL learning outcomes for that particular year of a teacher education degree. The scaffolded incremental learning and developmental features of the modules have been derived from the *TEIL Capability Development Schema*.



Figure 8. Information & Research Skills (IRS) tutorial delivered via the Blackboard Learning Management System

The entire IRS tutorial suite is made available to every enrolled teacher education student as a series of 4 non-award units through their learning management system. This asynchronous approach to learning allows students to work on developing their IL skills, processes and understandings to benchmarked requirements or beyond, at their own pace and in their own time, with the opportunity to revisit any module at any time. The asynchronous approach increases the flexibility and allows students to take control of their own learning, aligning with the aims and philosophy of the *UTAS TEIL Conceptual Framework*. Students are directed to the tutorial at scheduled points throughout the semester, and encouraged to complete the modules provided. Although the tutorial is not compulsory, this tool has, for the first time at UTAS, provided the off-campus student cohort with an equitable delivery of the teaching and access to the learning of IL skills, understandings, processes, strategies and tools.

Future Development

Whilst continuing to work on the *TEIL Toolkit*, we are also working on the construction of a subject content knowledge IL lens, by conducting a pilot study. Using this study we hope to provide the constructs for the subject content knowledge IL lens by unpacking the IL model for learning and gaining content knowledge within the context of subject content of a selected core unit. Should this pilot be successful, we intend testing the robustness and integrity of this IL lens for transferability across a range of content knowledge contexts, and ultimately across entire teacher education course structures. This would determine the transferability and adaptability of the *UTAS TEIL Conceptual Framework* into any context, and provide individuals within any discipline context with the capabilities that enable them to learn how to learn and gain subject content knowledge.

As the *UTAS TEIL Conceptual Framework* provides a strategic, holistic, equitable and sustainable model for collaborative curriculum design for IL and lifelong learning in teacher education, it has the potential to facilitate the development of teachers who are information literate individuals in their professional practice, able to be independent, self-directed lifelong learners, problem solvers, informed decision makers, creative and critical thinkers in the global teaching community. It is the result of a collaborative partnership that defines the roles of librarian and academic as complementary yet distinct, in design, delivery and assessment of unit content. The collaborative partnership between Library and Faculty has allowed the ongoing process of design, development, implementation, evaluation, and research to continue.

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